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**SUPERFUND PRELIMINARY CLOSEOUT REPORT  
MID-STATE DISPOSAL SITE  
MARATHON COUNTY, WISCONSIN**

## **I. INTRODUCTION**

This Preliminary Closeout Report documents that U.S. EPA has completed construction activities for the Mid State Disposal Site in accordance with OSWER Directive 9320.2-3C. U.S. EPA and the State of Wisconsin conducted a pre-final inspection on May 26, 1994, and determined that the contractor has constructed the remedy in accordance with remedial design (RD) plans and specifications (Please see Section IV of this Report). Activities necessary to achieve site completion are underway.

## **II. SUMMARY OF SITE CONDITIONS**

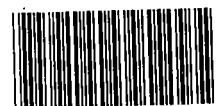
### Site Description

The Mid-State Disposal site is located in central Wisconsin, in Cleveland Township, Marathon County, on a 160-acre parcel of land about 4 miles northeast of Stratford and about 18 miles southwest of Wausau. The site consists of a 30-acre landfill, the Old Mound area, a 7-acre interim expansion landfill, and a 3 acre sludge lagoon (Figure 1). During the period of its operation from 1970 to 1979, the Mid-State Disposal site received domestic, industrial, commercial, and institutional wastes, as well as construction and demolition debris. These wastes included papermill sludges, coating sludges, fly ash, asbestos dust, mineral core waste, glue waste, solvents, pesticides, paint sludges, and heavy metals.

The geology of the site consists of ground moraine till overlying saprolite, which is underlain by metamorphic fractured-bedrock. The thickness of the till and saprolite varies from 0 to 23 feet and 2 to 7 feet respectively. Fracturing within the bedrock extends beyond 70 feet, which was the maximum depth of drilling performed during the Remedial Investigation (RI). Horizontal flow in the bedrock is partially controlled by two groundwater divides. One groundwater divide is oriented north-south below the eastern edge of the Old Mound area, which parallels the axis of the bedrock ridge found in this area. West of this divide, groundwater flows at a rate of 1200 ft/yr from the north and south toward the center of the old Mound Area, and then in a westerly direction. East of this divide, groundwater also enters the site from the north and south, but then flows to the east at a rate of 125 ft/yr. The other groundwater divide, which is oriented east-west, lies at the southern edge of the Old Mound area (Figure 2).

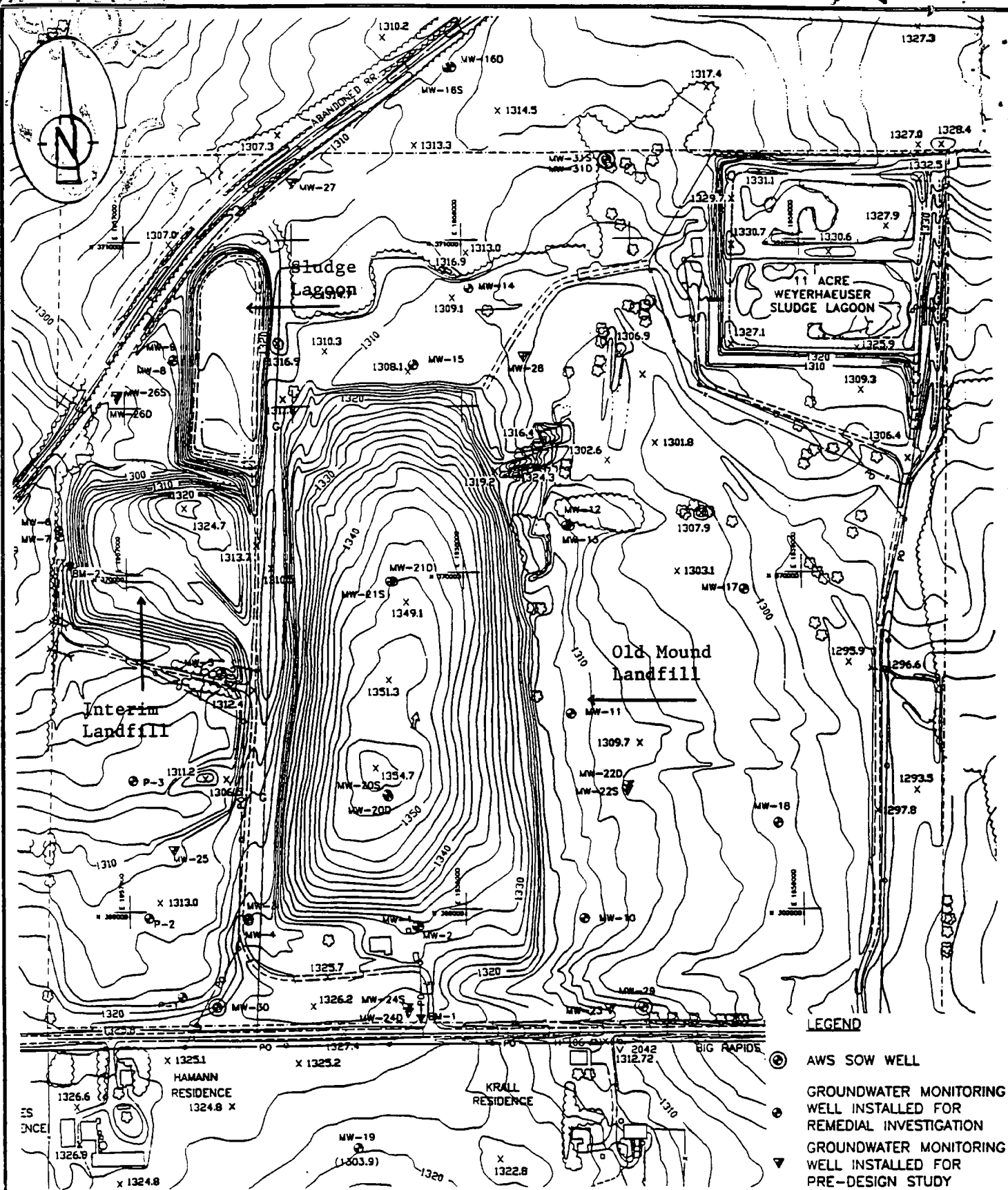
### Enforcement

Landfilling of municipal and industrial wastes at the site began in 1970 by Mid-State Disposal, Inc. after the Wisconsin Department of Natural Resources (WDNR) granted approval for these activities. In 1977, WDNR approved plans for closure of the Old Mound area, and construction of the sludge lagoon. Operation of the new waste disposal areas was approved in 1978. Environmental problems and permit violations at the site were noted in 1974 when WDNR inspected the site for compliance with their new solid waste disposal regulations. In response to these violations, WDNR brought legal



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MID-STATE WASTE DISPOSAL SITE  
WELL LOCATION DIAGRAM

DRAWN BY C.R.H. 11/2/92

CHECKED BY J.M.T. 11/2/92

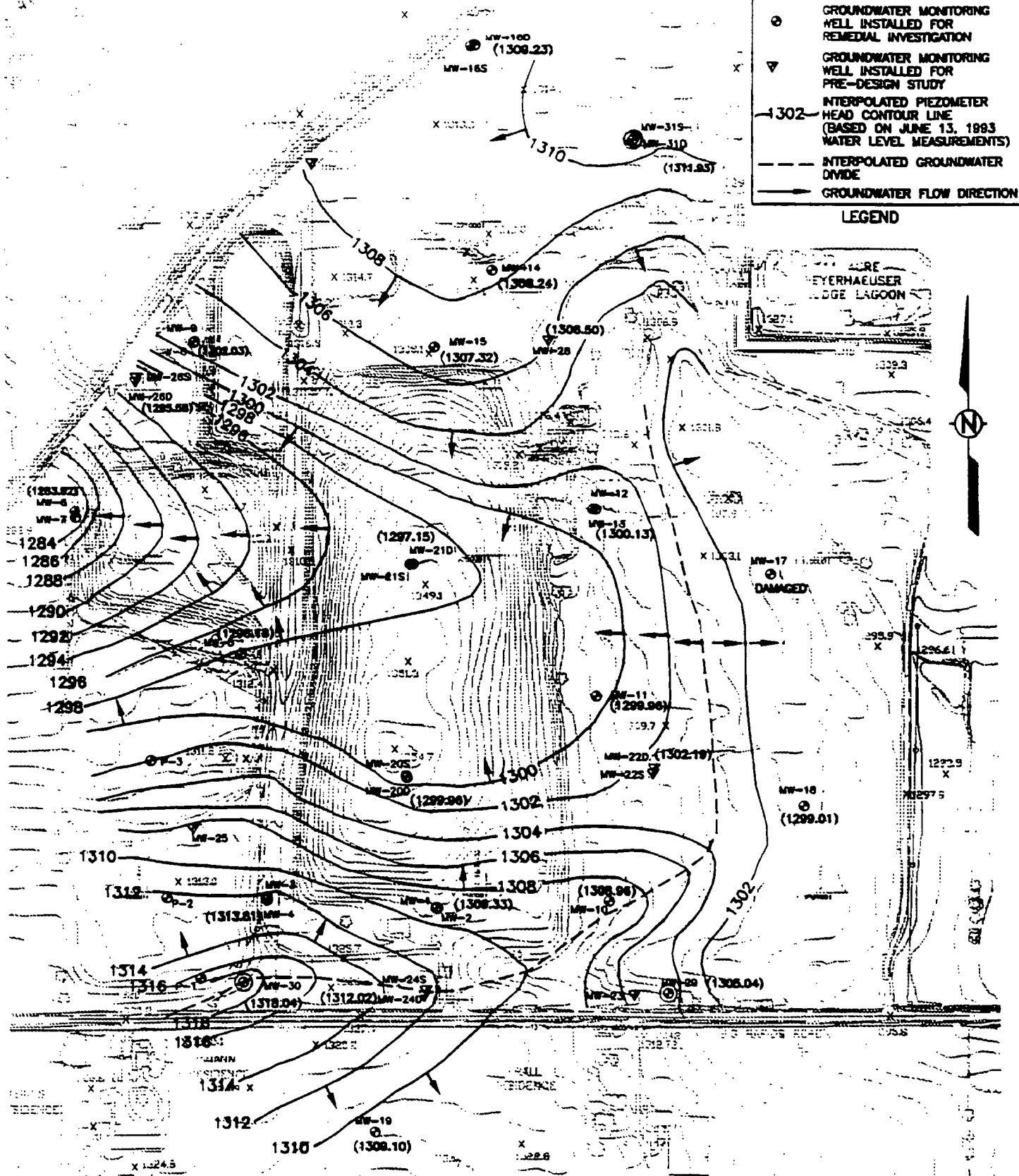
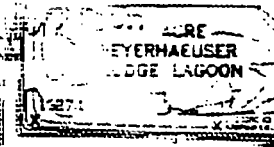
APPROVED BY T.W.W. 11/2/92

SCALE 1" = 400' FIGURE NO. 1

CADFILE MS-3EXTR.DWG STS PROJECT NO. 82685XJ  
PLOT DATE

- ⊙ WELL INSTALLED FOR AWS
- ⊙ GROUNDWATER MONITORING WELL INSTALLED FOR REMEDIAL INVESTIGATION
- ▽ GROUNDWATER MONITORING WELL INSTALLED FOR PRE-DESIGN STUDY
- 1302 — INTERPOLATED PIEZOMETER HEAD CONTOUR LINE (BASED ON JUNE 13, 1993 WATER LEVEL MEASUREMENTS)
- - - INTERPOLATED GROUNDWATER DIVIDE
- GROUNDWATER FLOW DIRECTION

# LEGEND



STS Consultants Ltd.  
Consulting Engineers

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PIEZOMETRIC HEAD DISTRIBUTION  
AND GROUNDWATER FLOW DIAGRAM  
IN BEDROCK AQUIFER  
MID-STATE WASTE DISPOSAL SITE

DRAWN BY	J.M.I.	6/22/94
CHECKED BY	J.M.T.	6/22/94
APPROVED BY	J.M.T.	6/22/94
CADFILE	82685602	SCALE
STS PROJECT NO.	82685XJ	FIGURE NO.
		2

action against Mid-State Disposal, Inc. A judgement was entered against the firm in 1977 for improper closure and abandonment of the Old Mound Landfill.

In 1979, an agreement was reached between the Weyerhaeuser Company, a generator of waste disposed at the facility, and WDNR, to properly abandon the facility. In 1980, the U.S. EPA began investigating the site as a candidate for inclusion on the Superfund National Priorities List (NPL). Mid-State was the first Wisconsin site nominated for inclusion on the NPL and was formally included on that list in September 1983.

The Remedial Investigation (RI) was conducted between the summer of 1983 and April 1988. The Feasibility Study (FS) was made available to the public on July 18, 1988. Based on these reports, a Record of Decision (ROD) was signed September 30, 1988. The major components of the selected remedy include:

- Site capping with a soil/clay cap that meets State solid waste landfill requirements.
- Installation of a leachate and gas condensate collection system.
- installation of the gas extraction system.
- Site monitoring will be conducted that includes groundwater, surface water, and the landfill gas monitoring to determine the effectiveness of the above measures and provide early warning as to the need for further actions.
- Alternate water supply to protect against potential future ingestion of contaminated groundwater.
- Improvement of surface water drainage
- Off-site treatment of leachate.
- Site fencing and sign posting for security.
- On-site road construction.
- Institutional controls to prevent well installation within the site boundary.

A negotiated consent decree (CD), incorporating the ROD, was entered into by the U.S. EPA, WDNR and four of the potentially responsible parties. The CD was entered by the United States District Court for the Western District of Wisconsin on March 28, 1990. On November 18, 1992 the CD was amended to include 16 surrounding municipalities. The Remedial Design was completed in March 1993 and was immediately followed by the initiation of the Remedial Action in the same month. 3/98

#### Community Relations Activities Performed

Historically, there has been very little community interest associated with the Mid-State site. Public meetings have been sparsely attended. A public meeting was held in June, 1992 to discuss design work on the Alternate Water Supply. A construction kick-off meeting was held in March 1993. Additionally, nine residents on Big Rapids Road had their domestic wells sampled on a quarterly basis and were contacted after each sampling event with the results.

### Remedial Construction Activities Performed

U.S. EPA in consultation with WDNR approved Ryan Incorporated Central as the construction contractor for the Mid-State site on March 29, 1993 and on-site construction began the following week. The construction was performed in two phases, Phase I was complete in 1993 and consisted of the following:

- placement of a final cover on the Old Mound and Interim Landfills;
- installation of the leachate and a gas condensate collection system;
- installation of the gas extraction system;
- installation of institution controls;
- off-site borrow source earthwork to import material for construction of the landfill and sludge lagoon covers; and
- placement of backfill and temporary cover on the sludge lagoon.

Phase II was complete by mid-1994 and consisted of the following:

- placement of the final cover on the sludge lagoon; and
- seeding of the entire site.

Two offsite borrow sources were used for supply of grading layer material, low hydraulic conductivity lay material (clay), frost protection/vegetative support (FP/VS) material and topsoil. The clay was obtained from a farm owned by Mr. and Mrs. Charles Hamann, located directly south and across the Big Rapids Road from the Mid-State site. The FP/VS material and topsoil were imported from a farm purchased by Weyerhaeuser Company from Mr. Laessig and located immediately east and adjacent to the Mid-State site. To haul material from the former Laessig farm to the Mid-State site, a construction access road was constructed from the northwest corner of the former Laessig farm around the north side of the Weyerhaeuser sludge lagoon, to the northeast corner of the Old Mound Landfill. This road passed through a wetland and thus a nationwide permit from the Army Corps of Engineers was required and was issued for a temporary access road. The substantive requirements of the WDNR Section 401 Water Quality Certification and NR 103 of Wisconsin Administrative code, were met and the road has since been removed and returned to natural grade.

Following the completion of the remedial action in June 1994, the long term monitoring effort is in effect. Groundwater, surface water, leachate and landfill gas will be monitored based on the schedule found in the Final Remedial Design Report. A summary of this schedule can be found in Table 1. This monitoring will alert the Agencies involved to any unexpected change in performance of the Remedial Action.

### **III. CHANGES TO THE MID-STATE ROD**

The initial concept for the Alternate Water Supply (AWS) as identified in the FS was to locate two water supply wells to serve the four nearest residents along Big Rapids Road. However, the RI showed no off-site contamination in the shallow aquifer where the residential wells were screened. Therefore, the AWS was brought forward only as a precautionary measure since the residential drinking water was uncontaminated. The cost and technical feasibility of this alternative were evaluated in the FS as follows: 1) the water supply wells were to be located upgradient of the contamination, 1,000 to 2,000 feet from the Mid-State site; 2) the wells were to be extended to depths

**TABLE 1  
MONITORING SCHEDULE**

Monitoring System	Sampling Locations	Parameters	Frequency
1. Groundwater	<u>Monitoring Wells</u> MW-22S, MW-22D, MW-23, MW-24S, MW-24D, MW-26S, MW-26D, MW-29, MW-30, MW-31S, MW-31D, MW-8, MW-10, MW-14, MW-17, Krall's well and Hamann's well	<u>Field Parameters</u> Elevation, color, odor, turbidity, Field temperature, pH and conductivity	Quarterly for the first 2 years, semiannually thereafter, to 4.5 years. At the 5-year sampling, the functioning monitoring wells on-site will be tested for the 8 RCRA metals, VOCs, and field parameters. Sampling frequency and parameters analyzed will be reevaluated during the 5-year Performance Review.
		<u>Indicator Parameters</u> Alkalinity, COD, total hardness, ammonia nitrogen, chloride, dissolved iron, sulfates, and nitrates and nitrite as N.	
		<u>Other Parameters</u> 8 RCRA metals, VOCs	
		<u>Field Parameters</u> Elevation, color, odor, turbidity, Field temperature, pH and conductivity	
2. Surface Water	Two locations on both the Tributary to Rock Creek and Rock Creek	<u>Indicator Parameters</u> Alkalinity, COD, total hardness, ammonia nitrogen, chloride, dissolved iron, sulfates, and nitrates and nitrite as N.	First 2 quarters (6 quarters are in conjunction with the AWS)
		<u>Other Parameters</u> 8 RCRA metals, VOCs	
		<u>Field Parameters</u> Elevation, color, odor, turbidity, Field temperature, pH and conductivity	
		<u>Indicator Parameters</u> Alkalinity, COD, total hardness, ammonia nitrogen, chloride, dissolved iron, sulfates, and nitrates and nitrite as N.	
3. Leachate	Grab sample from Dripleg C and Leachate Collection Tank A Composite sample from Leachate Collection Tank B and the WDNR UST.	<u>Other Parameters</u> 8 RCRA metals, VOCs	Quarterly for the first year, semiannually thereafter. Sampling frequency and parameters analyzed will be reevaluated during the 5-Year Performance Review.
		<u>Field Parameters</u> Elevation, color, odor, turbidity, Field temperature, pH and conductivity	
		<u>Indicator Parameters</u> Alkalinity, COD, total hardness, ammonia nitrogen, chloride, dissolved iron, sulfates, and nitrates and nitrite as N.	
		<u>Other Parameters</u> 8 RCRA metals, VOCs, copper, nickel, and zinc	
4. Gas	10 perimeter probes Flare - See Table 10.2	% methane, % oxygen, % LEL	Quarterly for the first 2 years, semiannually thereafter. Sampling frequency and parameters analyzed will be reevaluated during the 5-Year Performance Review
		Temperature, pressure, NR 445 compounds as noted in Table 3. NR 445 compounds to be determined first quarter only.	

FILE: LKS/sb/b: midmonitoring

of 30 feet; and, 3) the wells were to incorporate 500 feet of header piping and 4,000 feet of transfer piping.

During the course of the Pre-design field activities, STS, the consultant retained by the PRPs, completed an initial hydrogeologic evaluation of the area around the Mid-State site, specifically to address the potential of establishing high-capacity alternate water supply wells. A survey of area residents was also completed to assess their water needs.

Based upon the results of the initial field investigation and the Pre-design work, STS concluded that the local unconsolidated sediments, which were believed to offer the best potential for higher water yield, are not present in sufficient thickness or quality to provide an adequate AWS source. It was determined that several wells could be located in the bedrock, but the specific location would be difficult to identify from the geologic indicators and potential long-term reliability would be unpredictable as a water supply for up to nine residences.

On this basis, U.S. EPA and WDNR requested additional evaluation of the area hydrogeology and water quality data. The AWS final Scope of Work (SOW) was prepared to provide the additional data necessary to evaluate the area hydrogeology and water quality. The purpose of the final AWS SOW was to develop a groundwater quality trend analysis on which a final decision regarding the construction of the AWS could be based.

The Summary Report of the AWS SOW has been reviewed by the Agency. Quarterly data indicates the groundwater quality and flow patterns are consistent with time when the AWS data is compared to the RI and Pre-Design data. On-site groundwater below and adjacent to the Old Mound fill area is affected; however, affected groundwater has not migrated off-site so as to create adverse exposure to area residential wells. No observable adverse effects on residential wells were detected during the Study and consequently, residential drinking water supplies continue to be safe to consume. Based on the water level trends with time, the groundwater divides shift somewhat in their position; however, the data collected to date confirms that they persist in their general position relative to the fill areas and area residents. Given the permanence of the bedrock morphology and their role in creating the divides, these groundwater divides should persist indefinitely into the future. The Groundwater divides provide additional protection to residential wells as they serve to divert the flow of groundwater emanating from the site. Additionally, it is also expected that the performance of the Remedial Action will improve groundwater quality currently on-site due to less infiltration and volatiles removal. Based on the data generated, U.S. EPA will bring forward the recommendation to eliminate the AWS to the public during the ROD amendment process.

#### **IV. DEMONSTRATION OF QA/QC FROM CLEANUP ACTIVITIES**

The Remedial Design and the contract specifications for the Remedial Action were carefully reviewed by the U.S. EPA and WDNR for compliance with all requirements of the ROD and with all applicable QA/QC procedures and protocol. A Quality Assurance Project Plan (QAPP) was prepared for the Remedial Action. The QAPP is consistent with the requirements of U.S. EPA's Interim Guidelines and Specification for Preparing Quality Assurance Project Plans (QAM-005/80).

The clay obtained for the landfill covers passed all field and lab permeability tests. Therefore, U.S. EPA is assured that the landfill caps passed the maximum permeability requirement and construction is completed consistent with the ROD and specifications.

Several concerns arose during the construction of the sludge lagoon cover. These concerns were directed toward construction techniques, the fill material and the thickness of this material used in settlement areas that were a departure from the specifications. These concerns will be specifically outlined in the approval letter of the RA Report. It cannot be determined either way whether these departures will effect the performance of the sludge lagoon cover. However, given the long term operation and maintenance at the site and the long term groundwater monitoring plan, any change in the performance of the remedial action will be identified. Any additional work required to correct poor performance of the RA is mandated by the Consent Decree thus assuring that the protection of Human Health and the Environment will be maintained.

## **V. MONITORING RESULTS/OPERATION AND MAINTENANCE**

Twenty wells plus additional residences as determined by the AWS results will be sampled Quarterly for the first 2 years and semi annually thereafter until the five year review. At that time, the sampling frequency, location and analysis requirements will be evaluated by U.S. EPA and WDNR. A re-evaluation will be performed once every five years thereafter. Analysis will include field parameters, indicator parameters, VOCs and eight RCRA metals. Surface water will be sampled Quarterly for the first year, semiannually thereafter and for the same parameters as groundwater. Leachate will be sampled annually for the first 5 years and analyzed for the same parameters as groundwater with the addition of copper, nickel, and zinc. Gas will be sampled quarterly for the first 2 years and semiannually thereafter. Sampling parameters will include % methane, % oxygen, %LEL, Temperature, pressure, NR445 compounds as noted in Table 3. NR 445 compounds to be determined in the first quarter only. More detail on the long term monitoring can be found in Section 10 of the Final Design Report.

Six quarters of groundwater samples have been taken during the construction as part of the AWS scope of work. Result of this sampling can be found in the AWS Scope of Work Summary Report. The Landfill Gas Flare was sampled on July 8, 1994.

Specific Operation and Maintenance (O&M) requirements can be found the O&M plan for the Mid State Site.

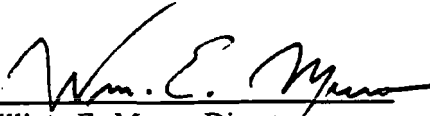
**VI. ACTIVITIES AND SCHEDULE FOR SITE COMPLETION**

The following activities will be completed according to the schedule described below:

<b>TASK</b>	<b>ESTIMATED COMPLETE</b>	<b>RESPONSIBLE ORGANIZATION</b>
Reseeding in bare areas	Fall 1994	Settling Defendants Contractor
Residential Groundwater Sampling	Quarterly	Settling Defendants Contractor
ROD Amendment Process	June 1995	U.S. EPA & State
Final Inspection	August 15, 1994	U.S. EPA & State
RA Report/Approval	October, 1994	U.S. EPA & State
Final Close Out	December, 1995	U.S. EPA & State

**VII. SUMMARY OF FIVE-YEAR REVIEW STATUS**

OSWER directive 9355.7-02 (Structure and Components of Five-Year Reviews, May 23, 1991) provides that U.S. EPA will conduct statutorily required five-year reviews (Statutory Reviews) at sites where, upon attainment of ROD cleanup standards, hazardous substances remaining on site will not allow for unlimited use and unrestricted exposure. Therefore a statutory review will be conducted in March 1998 as required under the directive or other guidance that is applicable at that time.

  
William E. Munro, Director  
Waste Management Division

9/22/94  
Date